SUSQUEHANNA RADIO CORP.

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April 23, 1998

Office of the Secretary (1800)
Room 222
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Reference: **RM-9208**

Susquehanna Radio Corp., (Susquehanna), licensee of 6 AM and 14 FM radio stations offers these comments on the requests for amendment of the Commission's rules to authorize the operation of low power radio stations.

Susquehanna, a broadcast station licensee for more than 55 years, opposes any authorization of low or micro-power radio stations. Our opposition is not made out of concern for economic damage to existing broadcasters but out of concern for the technical viability of the existing AM and FM bands.

The Leggett Request

This proposal appears to be contradictory in its basic premises. Leggett consistently cites the need for "niche" programming and their desire to serve "niche" markets. Their stated purpose for the proposed service is in part:

> "New musical groups could present their products to society and new social and political options could be discussed. Specialized stations would arise addressing specific subjects and activities such as golfing, flying, archery, energy conservation, ecology, animal rights, etc."

Susquehanna, which spends a great deal of time and money in programming research, finds it difficult to understand how any "niche" market can be served by an FM station operating with one watt and an antenna height of 50 feet. Programming to "niche" markets can only succeed with a station that has wide coverage. It is illogical to expect a reasonable number of persons interested in archery or ecology to live within several blocks of this transmitter. Anyone

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interested in expressing his social or political opinion would reach far more interested listeners by calling a full service radio talk show than on any number of one watt radio stations. Susquehanna's main concern with micro-power broadcasting is that it would probably not remain "micro" for very long. Attached is a recent Internet listing of FM transmitter kits available from Steven Dunifer's Radio Free Berkeley. For $105, anyone can purchase a 40 watt amplifier to add to their one watt micro-power station. If the Commission could make spectrum available for micro-power FM stations, the equipment available from Radio Free Berkeley and others will quickly destroy the operation of any licensee that is operating with a maximum of one watt.

The TRA Communications Request

This request for a low power FM broadcast service would have merit if spectrum were available; unfortunately, it is not.

The petitioner relies on statements of engineering consultants and broadcasters as well as the Commission's conclusions in Docket No. 96-120 concerning Grandfathered Short-Spaced FM Stations. The petitioner does not seem to recognize that this group of stations is considered to be "special" under the Commission's new rules. These are short spaced stations where the probability of interference presently exists. The industry discussion and Commission's conclusion in this Docket was to eliminate second and third channel restrictions only in these special cases because interference already exists due to their present short spacing. The Commission's decision was to retain these restrictions for all other stations and new allocations because they did not want to create new interference.

Susquehanna believes that with the adoption of Docket 80-90 and its present allocation polices, the Commission has maximized the use of the FM spectrum and any further change in the allocation tables would severely damage our existing FM broadcasting system.

As Susquehanna looks to the future of radio broadcasting, we envision to the emergence of Digital Radio and the incorporation of In-Band On-Channel (IBOC). A great deal of research and development into the possibility of IBOC has been completed and at least two systems are presently proposed. In these potential systems, the digital information resides in the area between 100 kHz. and 200 kHz. removed from the station's carrier. This digital information is actually in the spectrum of the first adjacent channel and is kept at a very low level in order to fit within the FCC required RF spectrum mask. These systems are very dependent on the existing FCC allocation policy and would be seriously hampered by the elimination of the second adjacent allocation separation requirements.

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For the preservation of our existing system of radio broadcasting and to allow the development of a digital broadcasting service for the United States, Susquehanna urges the Commission to dismiss both of these requests for Rulemaking.

Sincerely,

Charles T. Morgan

CTM/mek

Kits & Accessories From Free Radio Berkeley (As of 10-16-96)

First, a word from our legal department: For educational purposes only. These kits are offered for the furtherance of one's knowledge regarding radio frequency design and principles. At all times during operation the assembled unit must be connected to a dummy load. Part 15 of the FCC rules prohibits an antenna being used with these units. All responsibilities for the ultimate use of these kits are born solely by the builder and/or operator.

KITS AVAILABLE NOW ! All kits are complete and come with professionally manufactured, drilled and tinned PC boards. All coils are pre-wound. Each unit, unless specified, requires 12 volts for proper operation. Full instructions and diagrams included. Required tools include a 25-30 watt soldering iron with a fine tip, diagonal cutters, needle nose pliers, assorted screwdrivers and other small hand tools. Full assembly diagrams and instructions are included with each kit. Antenna construction diagrams are provided with each transmitter or amplifier order. Certain kits are designed to work with each other. For those whose wish to boost the output of their Ramsey FM- 10 the 1/2-1 watt amp will work very well for this purpose. The 30 watt amp is designed to be driven by 3-5 watts . The 15 watt amplifier is designed to be driven to full power with about 1/2 watt of input power, hence it works very well with the 1/2 watt stereo transmitter or PLL transmitter. If you wish to only boost a 1/2 watt signal to 5-7 watts then choose the 6 watt amplifier kit. An amplifier only increases the output power of a given input signal, it can not produce an FM signal whereas a transmitter or an exciter creates the FM signal at a suitable power level for possible further amplification by an RF amplifier.

NEW! **On Air Quick! Package and other partially assembled packages**.

1/2-1 Watt PLL Transmitter - $105

Our newest kit. Full digital PLL control locks the frequency and prevents any drift from happening. Will easily drive the 6-8, 10-15, 20-24 ans 40 watt amplifier kits. Easy to assemble and a major improvement over the Panaxis PLL kit. Available in an almost assembled form, just 10-12 components to solder in, for $155.

6 watt RF Amplifier - $30 Uses a rugged 6 watt transistor. It is designed to boost low wattage transmitters to a bit higher output power and will produce up to 8 watts of output power. A very small and compact circuit measuring 3 x 1 1/2 inches for 1/2 watt input drive. Easy, quick assembly. Requires 12-14 volts DC at 3/4 to 1 amp for operation.

15 watt RF Amplifier - $55 Uses a very high gain (14dB, power gain of at least 25X) RF transistor to boost a 1/2 watt input to 15 watts. Measures 2 1/2 by 5 inches and fits into a 4 x 6 enclosure (available punched and drilled). Includes heat sink. Easy, point to point surface mount assembly. Requires 12-14 volts at 2 amps for operation.

20 -24 watt RF amplifier - $115 $115 might sound a bit steep, but for those who do not wish to do an extensive amount of soldering and tuning, this is kit is for you. It uses a broad band high gain, RF power module which will put out a 20-24 watt signal for only a 100 to 200 miliwatt input. Kit requires less than 20 solder connections to complete, including a 5 element filter. Since the module is broad band from 88 to 108 MHz no tuning is required, plug and play as they say. Requires 12-14 volts at 6 amps.

25-30 watt RF Amplifier - $65 Will produce full power with an input drive of 3-5 watts. Fits a 4 x 6 inch enclosure (available punched and drilled). Easy point to point surface mount assembly. Includes heat sink. Requires 12-14 volts DC at 5 amps for operation.

30-40 Watt Amplifier - $105 30 to 40 watts of output power for an input of 1/2 watt. This is a two stage unit with a 5 watt and a 40 watt amplifier on the same board. Easy, large surface mount type assembly. Works very well with the PLL transmitter. Requires 7 amps at 12 volts DC.

1/2 to 1 watt Amplifier - $30 1/2 to 1 watt output for an input power of 10 mw. Great for boosting lower power VFOs and low power Ramsey FM-10 type kits. Very compact size, 3 1/2 X 1 1/2 inches. An optional transistor can be substituted to take the power up to 1 1/2 watts, add $5 for this option.

Filters

It is absolutely imperative to use a filter to prevent intereference from harmonics generated by the transmitter. Both these filters start to roll the signal off at 108-110 Mhz or so. Not using a filter will create problems and give the FCC ammunition to use against us. A clean signal is essential to the success of this movement.

Output Filter Kit - $10.00 A seven element low pass filter, composed of 4 coils and 3 capacitors, to flatten those harmonics. This one works well with the 6 watt and 15 watt amplifiers.

Heavy Duty Filer Kit - $25.00 A nine element low pass filter which will handle power levels to at least 100 watts. Use this filter with the 30 or 40 watt amplifers. Enclosure is $15.00

20 Watt Dummy Load Kit - $10.00 Essential for tuning up and testing transmitters and amplifiers. Will handle 20 watts without any strain, higher powers for a briefer period of time (i.e. shut down when it gets rather hot). Presents a uniform 50 ohm impedance to the transmitter.

50 Watt Dummy Load - $45 Fully assembled commercial unit

ANTENNA KITS

COMET ANTENNA - $115.00

A commercially made antenna for the FM broadcast band. It is a 5/8 ground plane design that assembles quickly and easily. It tunes by sliding the inner element up and down. Has a gain of 2.

These are partial kits, just go to your local plumbing supply or hardware store for the copper pipe and/or wire needed for completion. Full construction diagrams and instructions included.

J-Pole - $25 Metal box drilled with SO239 connector, tuning cap and tubing clamps. This one is know as the "electricians special" since it uses mostly electric hardware in its construction. Works very well for urban areas. No soldering of copper pipe required for assembly. Can be adjusted for operation over the entire FM band.

Slim Jim - $20 SO239 connector and clamps. Works very well for urban areas where a powerful horizontal pattern is needed. If used at too great of height, an area surrounding the antenna will be skipped over due to its low angle of radiation. Even at a height of only about 12 feet mounted on a traffic sign pole this antenna was able send a 5 watt signal 2-3 miles. Requires soldering of copper pipe. Can be placed inside a 6" piece of black plastic pipe for concealment. Provides a gain of 2-3.

Dipole - $20 Easy and quick design.

5/8 Ground Plane - $40 All necessary parts. This is a great design and works extremely well. It is very portable and will boost the power by a factor of 2.

POWER SUPPLIES

Unless you are planning on operating from a 12 volt lead acid battery or from the lighter socket in a vehicle you will need an AC operated DC power supply. Wall adapter units can not be used. We have the following units available.

2.5 Amp 13.8 V DC power supply - $35 Use this to power either the 1/2 watt PLL transmitter or a 1/2 watt PLL with a 6 watt amplifier 9 Amp 13.8 V DC power - $45 Use this to power the the 15 watt amplifier. 12 Amp 13.8 V DC power supply - $75 Use this to power the PLL with a 40 watt amplifier or 20 watt amplifier

METERS

Power & SWR Meters These are essential to the proper tuning and setting up of both transmitters and antennas. An antenna has to be fine tuned so that it accepts the full power of the transmitter and reflects the lowest amount possible back, that ratio of forward power to reflected power is know as the standing wave ratio (SWR). The various stages of both transmitters and amplifiers have adjustable capacitors which are used to tune the unit to the frequency of operation. A power meter allows you to see the effect of these adjustments on the power level and to set everything at an optimum level.

Economy Power/SWR meter - $35 A compact in-line unit that works up to a frequency range of 150 MHz.

High Quality Daiwa Meter - $100 A dual cross needle meter that shows both forward and reflected power on the same meter face. Makes tuning up very easy, no need to switch back and forth between these two functions. Compact design with 12 volt connection for lighting the meter face.

FREQUENCY COUNTER To accurately maintain your operating frequency a digital frequency counter is highly recommended. A digital tuner with signal strength indication can be used as a substitute. We have a frequency counter available for $80.00

COAXIAL CABLES

A coaxial cable is a special type of wiring that has an inner conductor surrounded by an insulating plastic sheath which is covered by a braid of copper wire that is then covered by a plastic jacket. The 75 ohm video cable used in home TV applications is one type of coaxial cable. For most RF purposes, 50 ohm cable is used. Quite a number of 50 ohm coaxial cables are available ranging from the rather small to cables over 1" in diameter. Regardless of the type, all such cables exhibit a loss that increases with frequency of operation and the length of the cable. For most purposes we will concern ourselves with Belden 9913 and RG8x (mini version of RG8). In very short runs RG58 can be used, but we prefer RG8x due to its lower loss and ability to stand a bit more abuse. Belden 9913 has the lowest loss of the group. Under no circumstances should the cables be twisted, kinked or crushed, this will cause major problems. We supply both RG8X and Beldedn 9913 in the following lengths. Each end is terminated with a PL259 plug.

RG8X: 25 feet - $15

RG8X: 50 feet - $25

RG8X: 75 feet- $35

RG8X: 100 feet - $40

Belden 9913 $1.00 ft in 25, 50, 75 and 100 ft lengths (custom lengths - $1.50 ft)

ENCLOSURES

4 x 6 aluminum chassis punched and drilled for 1/2 watt PLL xmtr, 15 watt amplifier or 30 watt amplifier - $20

7 x 7 aluminum chassis punched and drilled for 1/2 watt PLL transmitter with 6 watt amp - $25

The Brick Enclosure - 15 watt size -$40 / 20-40 watt size -$50 Combined heat sink and enclosure made from extruded aluminum. Will support a 1/2 watt PLL in combination with the 15, 20-24, or 40 watt amplifiers.

LIMITERS

A limiter is required to prevent over modulation of the FM signal. Over modulation will cause spurious emissions and interference with other signals plus sound very distored. It is extremely important to prevent this. We offer the Berhringer Autocom Limiter/Compressor for $195.00. At present we are working on a less expensive limiter kit which will be announced when it is finished, cost will be around $50.00.

MIXERS

A variety of mixers are available. For $250.00 we have a fairly nice unit from Gemini. For higher end applications we have a Behringer unit for $625.00. More brands will be availalbe soon.

VARIOUS & SUNDRY ITEMS

Tweak stick - $2.50 Essential to tuning transmitters and amplifiers. Non-conductive body with tiny metal blade at end. In tuning these transmitters and amplifiers a metal screwdriver will cause false tuning to happen due to the interactive effects of the metal and the holder of the screwdriver with the circuit. A plastic TV tuning tool kit can be found at Radio Shack as well.

Proceeds from the sales of these kits go to the furtherance of micro power broadcasting, bringing a voice of empowerment to every community.

Please add $6.00 for handling and shipping for each kit. $6.00 for the 2.5 & 4.5 amp power supply and $15.00 for the 12 amp power supply. Normal shipment is UPS 3 day select. COD orders add $8.00. Air mail to other countries, $12.00 per kit. We ship within 2-3 weeks after receipt of order, sometimes sooner depending on the work load.

Payment to be made out to Free Radio Berkeley Foreign orders please pay by money order drawn on US bank Free Radio Berkeley 1442 A Walnut St., #406 Berkeley, CA 94709 Voice mail: (510) 464-3041 Net mail: frbspd@crl.com